CLAIMS

1. A method of generating volume data from boundary representation data, comprising the steps of:

inputting the boundary representation data of an object into a computer via external data input means;

converting the boundary representation data into a triangle patch having a phase by data converting means;

dividing a space into rectangular parallelepiped cells whose boundary planes cross one another at right angles to associate the cell with a triangle to be included in the cell by associating means;

dividing the triangle patch having the phase, floating in a space, by cell faces to bring a state in which all the triangles are arranged inside the cell and on a boundary by dividing/arranging means;

integrating ridge lines by ridge line integrating means without changing the phase;

assigning each triangle and a vertex of the triangle to the cell with reference to index data of the vertex by cell assigning means; and

setting an attribute value of each cell by labeling means.

2. The method of generating the volume data from the boundary representation data according to claim 1, wherein after the ridge line integration by the ridge line integrating means,

it is checked whether or not triangle groups

decreased as a result of the ridge line integration satisfy
predetermined conditions by state check means, and

a defective portion is simplified by simplifying
means in a case where the predetermined conditions are not

5   satisfied, and thereafter the ridge line integration is
performed again by the ridge line integrating means.

3. The method of generating the volume data from
the boundary representation data according to claim 1 or 2,
wherein the volume data and the triangle patch having the

10   phase are prepared, and set operations of nonboundary cells,
the nonboundary cell to a boundary cell, and the boundary
cell to the boundary cell are performed based on the
connected triangles.

4. A program for generating volume data,

15   comprising:

an external data input step of inputting boundary
representation data of an object into a computer;

a data converting step of converting the boundary
representation data into a triangle patch having a phase;

20   an associating step of dividing a space into
rectangular parallelepiped cells whose boundary planes
cross one another at right angles to associate the cell
with a triangle to be included in the cell;

a dividing/arranging step of dividing the triangle

25   patch having the phase, floating in a space, by cell faces
to bring a state in which all the triangles are arranged
inside the cell and on a boundary;

a ridge line integrating step of integrating ridge lines without changing the phase;

a cell assigning step of assigning each triangle and a vertex of the triangle to the cell with reference to index data of the vertex; and

a labeling step of setting an attribute value of each cell.

5. The program for generating the volume data according to claim 3 further comprising, after the ridge line integrating step:

a state check step of checking whether or not triangle groups decreased as a result of the ridge line integration satisfy predetermined conditions; and

a simplifying step of simplifying a defective portion in a case where the predetermined conditions are not satisfied,

wherein the ridge line integrating step is thereafter performed again.

6. The program for generating the volume data according to claim 4 or 5, wherein the volume data and the triangle patch having the phase are prepared, and set operations of nonboundary cells, the nonboundary cell to a boundary cell, and the boundary cell to the boundary cell are performed based on the connected triangles.